

9 ART fillings placed in Chinese preschool children – results after 30 months. E.C.M. LO*, C.J. HOLMGREN (Faculty of Dentistry, University of Hong Kong)

The aim of this study was to evaluate longitudinally the status of ART fillings placed in primary teeth under field conditions in Chinese preschool children. In December 1996, a total of 170 ART fillings were placed in the primary teeth of 95 children aged 3-6 years in a kindergarten in southern China by seven final year dental students under supervision of their teachers. The material used was a hand-mixed glass ionomer, Ketac-Molar (ESPE). The fillings were assessed clinically every 6 months after placement for 30 months by two independent dentists. The evaluation criteria was success (filling present and not needing replacement) or failure (filling dislodged or in need of replacement). Over two-thirds of the fillings were followed up for 30 months. The filling success rates were as follows:

Class	No. placed	Success rate (%)		
		12 months	24 months	30 months
1	53	90	76	76
2	32	75	62	54
3/4	61	32	22	14
5	24	79	77	74

The differences in success rates between class types were statistically significant in all three examinations (Chi-squared test, $p < 0.001$). The result showed that the success rates of Class 1 and Class 5 ART fillings placed in primary teeth in Chinese pre-school children over 30 months were satisfactory.

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10 Efficacy and Safety of A Home Bleaching System using Three Progressive Strengths of Carbamide Peroxide – a 6-month clinical evaluation CG Toh* (Dept of Conservative Dentistry, University of Malaya, Kuala Lumpur, Malaysia)

The aim of this study was to evaluate the efficacy and safety of a dentist-prescribed at home tray-applied tooth whitening system (Trio™-Step Bleaching System, American Dental Hygienics, USA). Forty-two adults (15 males, 27 females) with various forms of tooth discoloration participated in the study with 40 completing treatment and 2 dropping out in midst of treatment. One subject with severe discoloration stopped treatment when improvement was not seen. Another dropped out for unknown reasons and was not contactable.

The subjects were instructed to wear a vacuum-formed custom-fitted soft tray that was applied with 11% carbamide peroxide for 1 hour twice a day for 7 days, followed consecutively for 7 days each of 13% and 16% carbamide peroxide gel for 2 hours twice daily according to manufacturer's instructions. Treatment was started in one jaw first with the opposing jaw acting as control. Treatment of opposing jaw began 2 weeks later after completion of 13% concentration. Vita Shade Guide measurements and colour slides were used to evaluate colour of teeth at baseline, at each weekly recall throughout period of treatment and 6 months after completion of treatment. Potential side effects such as tooth hypersensitivity, gingival and stomach irritation were assessed at each visit by questionnaire and clinical examination.

All examinations, instructions and evaluations were carried out by the author in the same clinic in the mornings. Thirty-eight subjects had significant lightening of their tooth colour by 2-3 shades with 30 cases of maxillary teeth and 29 mandibular teeth rated as having attained A1 shade at end of treatment. Two subjects with very severe discoloration did not have significant improvement. The colour change was stable at 6 months with only 2 subjects exhibiting 1 shade darker than shade attained after completion. Transient tooth sensitivity either during or for short period after treatment was experienced by 16 subjects when using 11% gel, 15 subjects for 13% gel and 13 subjects for 16% gel. Only 9 subjects had mild gingival irritation with 1 subject complaining of mild stomach irritation after swallowing the gel during initial treatment. On a 5-point categorical scale, all subjects except for two reported either very happy (23) or happy (13) with the results obtained. It was concluded that Trio™-Step Bleaching System can provide a very definitive whitening of teeth except for cases of very severe discoloration. Patients may experience transient tooth sensitivity or gingival irritation during or for short period after active treatment.

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11 Moisture Absorption of Carbon Reinforced Resin Posts PL LOH*, K. RAVI*, VK GANESH*, S RAMAKRISHNA*, CL CHEW* (Faculty of Dentistry*, Faculty of Engineering*, National University of Singapore)

Carbon fiber reinforced resin dental post has been available for restoration of endodontically treated teeth. It is known that composite materials absorbed moisture. The objective of this study was to determine the moisture absorption properties of a commercially available post (C post, Bisco Inc, USA) and an experimental carbon fiber reinforced resin post (FG post). The moisture absorption properties were evaluated using ASTM standard test method (Designation: D5229/D5229M-92). The specimens were first dried in a vacuum oven at 80°C and kept in a desiccator after it reached its effective moisture equilibrium. The base-line mass was recorded. The specimens were then placed in conditioning chamber with distilled water at 25°C, 40°C and 60°C. The specimens were weighed daily to monitor mass changes for 28 days. Similar trends in moisture absorption was observed in both groups of specimens. The maximum moisture content (Mm) and diffusivity (Dz) increased with time of exposure to moisture and temperature.

	Mm (%)			Dz /10 ⁻⁴		
	25°C	40°C	60°C	25°C	40°C	60°C
C post	2.12	2.18	2.40	1.375	1.555	1.682
FG post	2.38	3.00	3.02	0.164	0.238	0.293

The moisture content increased linearly in the first 36 hours and gradually approached a constant level. There was no significant difference in Mm for the two groups (t-test, $p > 0.05$). Dz showed significant differences (t-test, $P < 0.05$) between the two groups. It can be concluded that the FG post showed significantly lower diffusivity than the C post. The maximum moisture content for the two types of post were similar. This study was supported by NUS academic research grant No 960378/A.

12 In situ pellicle thickness variations in the oral cavity.

A. B. Sönju Clasen¹*, M. Hannig², T. Sönju¹.

1. Dept. of Cariology, Dental Faculty, University of Oslo, Norway.

2. Clinic of Operat. Dent. and Periodont., Christian-Albrechts-University of Kiel, Germany.

Earlier studies have shown that formation of buccal pellicle takes place in two stages. Firstly a basal granular layer is formed on the enamel surface, thereafter a second globular layer.

The aim of the present study was to investigate the ultrastructural appearance and relative thickness of the pellicle formed on the buccal and lingual sides of the first molar in the upper and lower jaw. Furthermore to assess the influence of the shearing forces (rubbing action) from the tongue on the pellicle formation in situ. Pumiced enamel pieces were mounted in appliances fitted for the upper and lower jaws and pellicle was allowed to form on unprotected or protected surfaces for 2 hours. To eliminate the contact with the tongue, enamel pieces were covered with orthodontic bands (for Auger analysis) or pellicle was allowed to form in enamel slots (for TEM examinations). Six study subjects carried the enamel specimens on the various oral sites. After removal from the appliances, the enamel pieces were rinsed in phosphate buffer and examined by Auger analysis or Transmission Electron Microscopy. The TEM examinations showed that pellicle formed buccally (upper and lower sites) consisted of two layers, whereas the globular second layer was not present in the pellicle formed on the lingual side of the upper molar. The pellicles formed on the protected- were not different from those formed on the unprotected surfaces. The Auger analysis corroborated the results from the TEM. The results indicate that the variation in pellicle thickness is not influenced by the rubbing action of the tongue.

13 CPITN and periodontal attachment loss in a high-risk population. TAIYEB ALI TB*, RAZAK IA, ZAIN RB (Faculty of Dentistry, University of Malaya, 50603 Kuala Lumpur, Malaysia).

The aim of this study was to determine the CPITN and the periodontal attachment loss status in a targeted high-risk population of Indian estate dwellers. The study population comprised of 208 subjects out of whom 34.1% were males and 65.9% females. The age categories of subjects were < 45 years (44.7%), 45-60 years (43.3%) and > 60 years (12%). All subjects were interviewed based on a structured questionnaire and clinically examined using the CPITN criteria and loss of attachment (LOA) measurements.

The prevalence of periodontal disease was 100%. The majority of subjects below 45 years had maximum CPITN score 3 (53.8%) whilst the majority in the older age categories had maximum CPITN score 4 (45-60 years = 50.6%, > 60 years = 60.9%). However these differences were not statistically significant. In terms of sextants, the highest percentage involvement was CPITN 3 for all age categories. The majority of subjects < 45 years (42.9%) and 45-60 years (42.9%) had maximum LOA of 6-8 mm. In contrast the majority of subjects above 60 years (62.5%) had maximum LOA of 9 mm or more. These differences were statistically significant ($p < 0.01$). In terms of sextants, the maximum LOA with the highest percentage involvement for the age group < 45 years (57.2%) and 45-60 years (43.5%) was 3-5 mm, whereas for those above 60 years (38.4%) it was 6-8 mm.

The results of this study confirm that the Indian estate population is a high-risk group for periodontal disease and periodontal attachment loss. It also indicates that the maximum CPITN and LOA score on an individual basis overestimate the treatments needs in terms of sextant involvement.

14 Periodontal Conditions in Adults Resident in Lhasa, Tibet. E.F. CORBET*, L.J. JIN, E.C.M. LO, W.K. LEUNG, K.Y. ZEE. (Faculty of Dentistry, The University of Hong Kong.)

Lhasa is the world's highest city. There have been no reports on the oral health status of its adult residents. The aim of this study was to report on the periodontal status of adult residents of Lhasa and to compare the periodontal status of native urban Tibetans with that of Han Chinese. A convenience sample of 25-34 and 35-44 year-old employees of three major enterprises in Lhasa was recruited. All subjects were examined by one of three trained examiners. The highest Community Periodontal Index (CPI) score and Attachment Loss (ALoss) score for each sextant was recorded. 97 adults aged 25-34 and 88 adults aged 35-44 were examined. The percentage of subjects by their highest CPI and ALoss scores is given in the table below:

Age	Ethnicity	n	CPI Scores				
			0	1	2	3	4
25-34	Han	30	0	0	43	37	20
	Tibetan	67	0	0	57	39	4
	Han	34	0	0	24	56	20
35-44	Tibetan	54	0	0	35	43	22

Age	Ethnicity	n	ALoss Scores				
			0 (0-4 mm)	1 (4-6 mm)	2 (6-8 mm)	3 (8-11 mm)	4 (11 mm+)
25-34	Han	30	47	30	20	0	3
	Tibetan	67	46	37	15	2	0
	Han	34	21	56	21	0	3
35-44	Tibetan	54	22	43	22	7	6

*The younger Tibetan adult residents of Lhasa had a lesser prevalence of deep pockets than the Han ($p < 0.05$). However there was no difference ($p > 0.05$) between the two ethnic groups in terms of prevalence of the various levels of periodontal attachment loss within each age group.

15 CPITN Assessment of Periodontal Condition of Filipino Workers in Tokyo. S. M. SAN MIGUEL*, K. CARINO, E. SUGIYAMA, I. ISHIKAWA, (Department of Periodontology, Department of Preventive Dentistry, Tokyo Medical and Dental University, Tokyo, Japan).

The objective of this study was to determine the periodontal condition of Filipino migrant workers in Tokyo Metropolitan Area. The study population consisted of 163 Filipino workers (79 men and 84 women) aged 15-64 years old. The demographic profile of the subjects was obtained through a self-administered questionnaire. The WHO probe was used in determining the CPITN scores. At the same time, periodontal attachment loss from each sextant was also measured. Periodontal conditions according to the highest CPITN code per person, were as follows: Healthy (CPITN 0)=10.4 %, Bleeding (CPITN 1)=6.1 %, Calculus (CPITN 2)=48.5 %, Shallow pocket (CPITN 3)=20.3 %, Deep pocket (CPITN 4)=14.7 %. Data also revealed that age, sex and type of work of Filipinos were significant demographic factors related to CPITN. The extent of loss of attachment and CPITN values were highly correlated at a p -value < 0.001 . In conclusion, a high prevalence of periodontal disease was found in Filipino workers in Tokyo. This finding suggested that more attention should be directed towards oral hygiene instruction and periodontal treatment to reduce disease progression among Filipino workers.

16 Periodontopathogens in Han Chinese and Tibet Patients with Adult Periodontitis. L.J. JIN*, W.K. LEUNG, E.F. CORBET, E.C.M. LO and K.Y. ZEE. (Faculty of Dentistry, The University of Hong Kong).

This preliminary study was to determine the presence and infection patterns of five subgingival periodontopathogens in adult periodontitis (AP) patients from Hong Kong and Tibet. The participants were 26 patients with untreated AP, 14 Han Chinese residents in Hong Kong (HK-group) and 12 age- and periodontal disease-matched Tibet residents in Lhasa, Tibet (Tibet-group), aged 30 to 55 yrs. Of the Tibet patients, 6 were native Tibetans and 6 were Han Chinese who had lived in Tibet ≥ 10 yrs. 10 healthy Han Chinese from Hong Kong were used as controls. In each patient, subgingival plaques were collected by two paper points, one from periodontitis site with deepest probing depth (5-8 mm) and one from a site without periodontal destruction. In each control subject, two healthy sites were sampled. Five species-specific DNA probes were used to detect the presence of *A. actinomycetemcomitans* (Aa), *B. forsythensis* (Bf), *P. gingivalis* (Pg), *P. intermedia* (Pi) and *T. denticola* (Td), with a sensitivity $\geq 10^3$ cells/sample. Aa could not be detected in any subjects. In healthy controls, only Pi was detected in two subjects. Bf, Pg, Pi and Td were frequently detected in both HK-group (70%, 93%, 71% and 93%) and Tibet-group (75%, 83%, 83% and 75%), respectively. These species were more frequently found in periodontitis sites than in sites without destruction, within both HK-group and Tibet-group as determined by χ^2 tests ($p < 0.01$). The predominant infection pattern in periodontitis sites was co-infection by Bf, Pg, Pi and Td, within both HK-group (72%) and Tibet-group (58%), and no significant difference was found between the groups. Prevalence of the target species was similar in native Tibetans and Han residents of Tibet. The total count of the target species in periodontitis sites was higher in Han Chinese ($1.2 \times 10^5 \pm 0.4 \times 10^5$) than in native Tibetans ($0.3 \times 10^5 \pm 0.2 \times 10^5$) as determined by Mann-Whitney tests ($p < 0.05$), although there was no difference in probing depth. This study shows that there is a similar predominant co-infection of *B. forsythensis*, *P. intermedia* and *T. denticola* in untreated adult periodontitis patients from Tibet and Han Chinese in Hong Kong. This study was in part supported by CRCG(337/354/0010) and RGC(HKU 7287/97M).